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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/535,524

05/18/2005

Jerome Daniel

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DRINKER BIDDLE & REATH LLP
ATTN: PATENT DOCKET DEPT.
191 N. WACKER DRIVE, SUITE 3700
CHICAGO, IL 60606

EXAMINER

MONIKANG, GEORGE C

ART UNIT

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/535,524	Applicant(s) DANIEL, JEROME	
	Examiner GEORGE C. MONIKANG	Art Unit 2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/18/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4-6 & 11-22 is/are rejected.
- 7) ☒ Claim(s) 2,3 and 7-10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/535,524.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/15/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4-5, 11, 13-16 & 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Revit et al, US Patent Pub 2001/0040969 A1.

Re Claim 1, Revit et al discloses a method of processing sound data, wherein, before a playback of the sound by a playback device: a) signals representative of at least one sound propagating in a three-dimensional space (fig. 1b; para 0067) and arising from a source situated at a first distance from a reference point are coded so as to obtain a representation of the sound by components expressed in a base of spherical harmonics (paras 0054; 0067), of origin corresponding to said reference point (para 0054), b) and a compensation of a near field effect is applied to said components by a filtering which is dependent on a second distance defining substantially (para 0053), for a playback of the sound by said playback device, a distance between a playback point and a point of auditory perception (para 0079).

Re Claim 4, Revit et al discloses the method as claimed in claim 1, wherein the data coded and filtered in steps (para 0053) a) and b) are transmitted to the playback device with a parameter representative of said second distance (para 0079).

Re Claim 5, Revit et al discloses the method as claimed in claim 1 wherein, the data coded and filtered in steps (para 0053) a) and b) are stored with a parameter representative of said second distance on a memory medium intended to be read by the playback device (para 0079).

Re Claim 11, Revit et al discloses the method as claimed in claim 1 wherein there is provided a microphone comprising an array of acoustic transducers arranged substantially on the surface of a sphere whose center corresponds substantially to said reference point (para 0067), so as to obtain said signals representative of at least one sound propagating in the three-dimensional space (para 0067).

Re Claim 13, Revit et al discloses the method as claimed in claim 11 wherein there is provided a number of transducers that depends on a total number of components chosen to represent the sound in said base of spherical harmonics (para 0067).

Re Claim 14, Revit et al discloses the method as claimed in claim 1, in which in step a) a total number of components is chosen from the base of spherical harmonics so as to obtain, on playback (paras 0067, 0079), a region of the space around the point of perception in which the playback of the sound is faithful and whose dimensions are increasing with the total number of components (para 0079).

Re Claim 15, Revit et al discloses the method as claimed in claim 14, wherein there is provided a playback device comprising a number of loudspeakers at least equal to said total number of components (paras 0067, 0079).

Re Claim 16, Revit et al discloses the method as claimed in claim 1 wherein: there is provided a playback device comprising at least a first and a second loudspeaker disposed at a chosen distance from a listener (para 0079), a cue of awareness of the position in space of sound sources situated at a predetermined reference distance from the listener is obtained for this listener (para 0079), and the compensation of step b) is applied with said reference distance substantially as second distance (para 0079).

Re Claim 21, Revit et al discloses a sound acquisition device, comprising a microphone furnished with an array of acoustic transducers disposed substantially on the surface of a sphere (fig. 1b; para 0067), wherein the device furthermore comprises a processing unit arranged so as to: receive signals each emanating from a transducer, apply a coding to said signals so as to obtain a representation of the sound by components expressed in a base of spherical harmonics (paras 0054; 0067), of origin corresponding to the center of said sphere, and apply a filtering to said components, which filtering is dependent (para 0053), on the one hand, on a distance corresponding to the reference distance (para 0079).

Re Claim 22, Revit et al discloses the device as claimed in claim 21, wherein said filtering consists, on the one hand, in equalizing (para 0079), as a function of the radius of the sphere, the signals arising from the transducers so as to compensate for a weighting of directivity of said transducers and (para 0079), on the other hand, in compensating for a near field effect as a function of a chosen reference distance (para 0079), defining substantially, for a playback of the sound, a distance between a playback point and a point of auditory perception (para 0079).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 6, 12 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Revit et al, US Patent Pub 2001/0040969 A1.

Re Claim 6, Revit et al discloses the method as claimed in claim 4, in which, prior to a sound playback by a playback device comprising a plurality of loudspeakers disposed at a third distance from said point of auditory perception (*Revit et al, para 0079*), a filter whose coefficients are dependent on said second and third distances is applied to the coded and filtered data (*Revit et al, para 0078*).

However, Revit et al and Jot et al fail to disclose the filter being an adaptive filter. Official notice is taken that both the concepts and advantages of providing an adaptive filter are well known in the art. Thus it would have been obvious to use an adaptive filter since they are commonly used to self adjust transfer functions according to optimizing algorithm.

Claims 12 & 17 have been analyzed and rejected according to claim 6.

5.

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6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Revit et al, US Patent Pub 2001/0040969 A1 as applied to claim 1 above, and further in view of Jot et al, US Patent 7,231,054 B1.

Re Claim 18, Revit et al discloses the method as claimed in claim 16, but fails to disclose wherein: the playback device comprises a headset with two headphones for the respective ears of the listener (*Jot et al, col. 5, lines 5-15*), and separately for each headphone, the coding and the filtering of steps a) and b) are applied with regard to respective signals intended to be fed to each headphone (*Jot et al, col. 5, lines 5-15*), with, as first distance, respectively a distance separating each ear from a position of a source to be played back (*Jot et al, col. 5, lines 5-15*). However, Jot et al does.

Taking the combined teachings of Revit et al and Jot et al as a whole, one skilled in the art would have found it obvious to modify the method of Revit et al with a playback device comprises a headset with two headphones for the respective ears of the listener (*Jot et al, col. 5, lines 5-15*), and separately for each headphone, the coding and the filtering of steps a) and b) are applied with regard to respective signals intended to be fed to each headphone (*Jot et al, col. 5, lines 5-15*), with, as first distance,

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respectively a distance separating each ear from a position of a source to be played back (Jot et al, col. 5, lines 5-15) as taught in Jot et al to be able to implement the processing in a headphone system.

Re Claim 19, Revit et al discloses the method as claimed in claim 1, but fails to disclose wherein a matrix system is fashioned (Jot et al, col. 9, lines 22-53), in steps a) and b), said system comprising at least: a matrix comprising said components in the base of spherical harmonics (Jot et al, col. 9, lines 22-53), and a diagonal matrix whose coefficients correspond to filtering coefficients of step b) (Jot et al, col. 9, lines 22-53), and said matrices are multiplied to obtain a result matrix of compensated components (Jot et al, col. 9, lines 22-53). However, Jot et al does.

Taking the combined teachings of Revit et al and Jot et al as a whole, one skilled in the art would have found it obvious to modify the method of Revit et al with a matrix system is fashioned (Jot et al, col. 9, lines 22-53), in steps a) and b), said system comprising at least: a matrix comprising said components in the base of spherical harmonics (Jot et al, col. 9, lines 22-53), and a diagonal matrix whose coefficients correspond to filtering coefficients of step b) (Jot et al, col. 9, lines 22-53), and said matrices are multiplied to obtain a result matrix of compensated components (Jot et al, col. 9, lines 22-53) as taught in Jot et al to find a set of complex scalars for a given frequency.

Claim 20 has been analyzed and rejected according to claim 19.

Allowable Subject Matter

1. Claims 2-3, 7-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
2. The following is a statement of reasons for the indication of allowable subject matter for claims 2-3, 7-10 the prior art does not teach or moderately suggest the following limitations:

Wherein, said source being far removed from the reference point: components of successive orders m are obtained for the representation of the sound in said base of spherical harmonics, and a filter is applied, the coefficients of which, each applied to a component of order m , are expressed analytically in the form of the inverse of a polynomial of power m , whose variable is inversely proportional to the sound frequency and to said second distance, so as to compensate for a near field effect at the level of the playback device.

Limitations such as these may be useful in combination with other limitations of claim 1.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GEORGE C. MONIKANG whose telephone number is (571)270-1190. The examiner can normally be reached on M-F. alt Fri. Off 7:30am-5:00pm (est).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George C Monikang/
Examiner, Art Unit 2615

7/3/2008

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2615